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**Nikita A. Sakhanenko\*** ([sanik@cs.unm.edu](mailto:sanik@cs.unm.edu)), Department of Computer Science, University of New Mexico, Albuquerque, NM 87131. *Causally Informed Context Management and Model Induction in a Context-Partitioned Stochastic Modeling System*. Preliminary report.

In this talk I describe a flexible multi-layer architecture for context-sensitive stochastic modeling. The architecture incorporates a high performance stochastic modeling core based on a recursive form of probabilistic logic. On top of this modeling core, causal representations and reasoning direct a long-term incremental learning process that produces a context-partitioned library of stochastic models. The failure-driven learning procedure for expanding and refining the model library employs a combination of abductive inference together with EM model induction to construct new models when current models no longer perform acceptably. The system uses a causal finite state machine representation to control on-line model switching and model adaptation along with embedded learning. The system is designed to support operational deployment in real-time monitoring, diagnostic, prognostic, and decision support applications. In this talk I describe the basic multi-layer architecture along with new learning algorithms inspired by developmental learning theory. (Received August 15, 2007)